

DERWENT-ACC-NO: 2000-588847
DERWENT-WEEK: 200124
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TITLE: An electroacoustic transducer e.g. piezoelectric receiver in mobile telephone, as well as sounders, speakers and buzzers includes diaphragm fixed with adhesive along its shorter sides and sealant along its longer sides

INVENTOR: KISHIMOTO, T; TAKESHIMA, T

PATENT-ASSIGNEE: MURATA MFG CO LTD[MURA]

PRIORITY-DATA: 1999JP-0293205 (October 15, 1999) ,
1999JP-0042587 (February 22, 1999)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES
MAIN-IPC			
KR 2000062580	October 25, 2000	N/A	000
H04R 017/00			
A	August 30, 2000	E	012
031/00			H04R
EP 1032244 A2	August 30, 2000	N/A	000
H04R 017/00			
CN 1265001 A	November 7, 2000	N/A	006
H04R 017/00			
JP 2000312398			
A			

DESIGNATED-STATES: AL AT BE CH CY DE DK ES FI FR GB GR
IE IT LI LT LU LV MC MK N

L P T R O S E S I

APPLICATION-DATA:

PUB-NO	APPL-DESCRIPTOR	APPL-NO	APPL-DATE
KR2000062580A	N/A	2000KR-0008163	February 21, 2000
EP 1032244A2	N/A	2000EP-0102063	February 2, 2000
CN 1265001A	N/A	2000CN-0102643	February 22, 2000
JP2000312398A	N/A	1999JP-0293205	October 15, 1999

INT-CL_(IPC): G10K009/122; H04R017/00 ; H04R031/00

ABSTRACTED-PUB-NO: EP 1032244A

BASIC-ABSTRACT: NOVELTY - A diaphragm (1) is retained at its periphery by a ceramic or resin casing (10) formed as a rectangular box having two short (12) and two long (13) side walls. The diaphragm consists of a rectangular piezoelectric plate and a metal plate having the same width but a greater length. Two shorter sides of the diaphragm are fixed by an adhesive (4) and gaps formed between the longer sides and the side walls are sealed by an elastic sealant such as a silicone rubber (5).

USE - The electroacoustic transducer e.g. piezoelectric receiver in a mobile telephone, as well as piezoelectric sounders, speakers and buzzers.

ADVANTAGE - The sealant does not limit the deflection of the diaphragm and a large sound pressure is generated for a given electrical energy

applied.

DESCRIPTION OF DRAWING(S) - The figure shows a perspective view of an electroacoustic transducer.

Diaphragm 1

Adhesive 4

Elastic sealant 5

Casing 10

Short side 12

Long side 13

CHOSEN-DRAWING: Dwg.4/13

TITLE-TERMS:

ELECTROACOUSTIC TRANSDUCER PIEZOELECTRIC RECEIVE
MOBILE TELEPHONE WELL SOUND
SPEAKER BUZZ DIAPHRAGM FIX ADHESIVE SHORT SIDE SEAL
LONG SIDE

DERWENT-CLASS: P86 V06 W01

EPI-CODES: V06-A01; V06-C; V06-E02; V06-L01A; W01-C01D3C;

SECONDARY-ACC-NO:

Non-CPI Secondary Accession Numbers: N2000-435764

DERWENT-ACC-NO: 2001-032753
DERWENT-WEEK: 200106
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TITLE: Piezoelectric acoustic device e.g. for buzzer has insulator
cap held
with adhesive to diaphragm

INVENTOR: DAIDAI, M; FUJINO, M ; KISHIMOTO, T ; NOMURA, A ;
TAKESHIMA, T

PATENT-ASSIGNEE: MURATA MFG CO LTD[MURA]

PRIORITY-DATA: 1999JP-0293204 (October 15, 1999) ,
1999JP-0040875 (February 19,
1999) , 1999JP-0042586 (February 22, 1999) , 1999JP-0293203
(October 15, 1999)

PATENT-FAMILY:

PUB-NO	PUB-DATE	LANGUAGE	PAGES
MAIN-IPC			
JP 2000310990	November 7, 2000	N/A	008
G10K 009/122			
A	September 7, 2000	N/A	022
017/00			H04R
DE 10007455 A1	August 23, 2000	N/A	000
G10H 003/00			
CN 1264104 A	November 2, 2000	N/A	007
G10K 009/122			
JP 2000305573			
A			

APPLICATION-DATA:

PUB-NO	APPL-DESCRIPTOR	APPL-NO
JP2000310990A	N/A	1999JP-0293203
APPL-DATE		October

15, 1999

DE 10007455A1 N/A

2000DE-1007455

February 18, 2000

CN 1264104A N/A

2000CN-0102367 February

18, 2000

JP2000305573A N/A

1999JP-0293204 October

15, 1999

INT-CL_(IPC): G10H003/00; G10K009/122 ; H03H009/10 ;
H04R017/00

ABSTRACTED-PUB-NO: DE 10007455A

BASIC-ABSTRACT: NOVELTY - The device has a diaphragm (1) comprising a rectangular piezoelectric plate (2) and a metal plate (3) connected to piezoelectric plate. An insulator cap (4) has two holding parts (4c) for holding the diaphragm inside the cap on the cap's inside walls. Two of the sides of the diaphragm are held with adhesive to the holding parts. A gap between the other two sides of the diaphragm and the cap is filled with elastic sealing material. An acoustic chamber is defined between the diaphragm and the upper wall (4a) of the cap.

DETAILED DESCRIPTION - An INDEPENDENT CLAIM is included for a piezoelectric acoustic device.

USE - For a buzzer, loudspeaker, sounder, alarm etc. used in domestic appliances, portable telephones or headphones, e.g. for emitting warning sounds or operating sounds.

ADVANTAGE - Small. High production efficiency, and high

transducing
efficiency.

DESCRIPTION OF DRAWING(S) - The drawing shows a section
through the device.

Diaphragm 1

Piezoelectric plate 2

Metal plate 3

Insulator cap 4

CHOSEN-DRAWING: Dwg.5/23

TITLE-TERMS:
PIEZOELECTRIC ACOUSTIC DEVICE BUZZ INSULATE CAP HELD
ADHESIVE DIAPHRAGM

DERWENT-CLASS: P86 V06 W05

EPI-CODES: V06-A01; V06-E02; V06-L01A; W05-A02;

SECONDARY-ACC-NO:
Non-CPI Secondary Accession Numbers: N2001-025512

CLIPPEDIMAGE= JP411355890A
PAT-NO: JP411355890A
DOCUMENT-IDENTIFIER: JP 11355890 A
TITLE: PIEZOELECTRIC ACOUSTIC COMPONENT

PUBN-DATE: December 24, 1999

INVENTOR-INFORMATION:

NAME	COUNTRY
YAMAMOTO, TAKASHI	N/A
TAKESHIMA, TETSUO	
KISHIMOTO, KENJI	N/A

N/A

ASSIGNEE-INFORMATION:

NAME	COUNTRY
MURATA MFG CO LTD	N/A

APPL-NO: JP10163841
APPL-DATE: June 11, 1998

INT-CL_(IPC): H04R017/00; H03H009/10

ABSTRACT:

PROBLEM TO BE SOLVED: To obtain an piezoelectric acoustic component that is easily configured to be a surface mount type with a high production efficiency and a satisfactory acoustic conversion efficiency.

SOLUTION: A unimorph type diaphragm 1 is configured by adhering a rectangular metal plate 3 on a rear side of a rectangular piezoelectric plate 23, and both

ends of the diaphragm 1 in the lengthwise direction are fixed to a base 10 via conductive support members, 5. The metal plate 3 of the diaphragm 1 connects to a 1st electrode 11 of the base 10 via the support member and a surface electrode 2a of the piezoelectric plate 2 is connected to a 2nd electrode 12 of the base 10 via a conductive wire 6. A gap between the base 10 and both ends of the diaphragm 1 in the broadwise direction are sealed by a silicone rubber 13, to form an acoustic space between the diaphragm 10 and the base 10. The diaphragm 1 is covered in a contactless state, and a cover 20 with sounding holes 21 is adhered part fixed onto the base 10.

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4 ④
CLIPPEDIMAGE= JP411355891A

PAT-NO: JP411355891A

DOCUMENT-IDENTIFIER: JP 11355891 A

TITLE: PIEZOELECTRIC DIAPHRAGM AND PIEZOELECTRIC
ACOUSTIC COMPONENT USING THE
PIEZOELECTRIC DIAPHRAGM

PUBN-DATE: December 24, 1999

INVENTOR-INFORMATION:

NAME	COUNTRY
YAMAMOTO, TAKASHI	N/A
TAKESHIMA, TETSUO	
KISHIMOTO, KENJI	N/A

N/A

ASSIGNEE-INFORMATION:

NAME	COUNTRY
MURATA MFG CO LTD	N/A

APPL-NO: JP10163842

APPL-DATE: June 11, 1998

INT-CL_(IPC): H04R017/00; H03H009/10

ABSTRACT:

PROBLEM TO BE SOLVED: To obtain a piezoelectric acoustic component that has satisfactory acoustic concision efficiency, easily enabling obtaining low frequencies and is easily configured to be a surface mounting type.

SOLUTION: Slits 2c are formed in parallel with a top plate of a metal plate 2

that is drawn into a cap shape to the metal plate 2 and a unimorph diaphragm 1 is configured by adhering face so as to face a rectangular piezoelectric plate 3 to part of the metal plate 2 between the slits 2c electrically and mechanically. The slits 2c of the diaphragm 1 are sealed with a flexible sealing material 4, a lower end of a circumferential wall of the metal plate 2 is adhered and fixed to a base plate 10 with a 1st electrode 11 and a 2nd electrode 12 for forming an acoustic space 5 between the metal plate 2 and the base 10. The metal plate 2 connects to the 1st electrode 11, a surface electrode 3a of the piezoelectric plate 3 is connected to the 2nd electrode 12 by a wire 6, the diaphragm 1 is covered in a contactless state and a cover 20 while sounding holes 21 is adhered and fixed to the base 10.

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CLIPPEDIMAGE= JP411355892A
PAT-NO: JP411355892A
DOCUMENT-IDENTIFIER: JP 11355892 A
TITLE: PIEZOELECTRIC DIAPHRAGM AND PIEZOELECTRIC
ACOUSTIC COMPONENT USING THE
PIEZOELECTRIC DIAPHRAGM

PUBN-DATE: December 24, 1999

INVENTOR-INFORMATION:

NAME	COUNTRY
YAMAMOTO, TAKASHI	N/A
TAKESHIMA, TETSUO	
KISHIMOTO, KENJI	N/A

N/A

ASSIGNEE-INFORMATION:

NAME	COUNTRY
MURATA MFG CO LTD	N/A

APPL-NO: JP10163843
APPL-DATE: June 11, 1998

INT-CL_(IPC): H04R017/00; H03H009/10

ABSTRACT:

PROBLEM TO BE SOLVED: To obtain a piezoelectric acoustic component that has satisfactory acoustic conversion efficiency, has easily low frequencies and is easily configured to be a sound mount type.

SOLUTION: A unimorph diaphragm 1 is formed by adhering a piezoelectric plate 3

to a top plate of a metallic plate 2 that is drawn into a cap shape and slits 2c are formed to the metal plate 2 to surround an area to which the piezoelectric plate 3 is adhered. Four connection parts 2e to connect a part 2d surrounded to by the slits 2c and parts at the outside of the slits are provided at a position a part by $1/6$ the total length L formed both ends of the part 2d surrounded by the slits 2c in the lengthwise direction. The slits 2c are sealed with a flexible sealing material 4, a lower end of a circumferential wall of the metal plate 2 is adhered and fixed to a base plate 10 with a 1st electrode 11 and a 2nd electrode 12 to form an acoustic space 5 between the metal plate 2 and the base 10. The metal plate 2 connects to the 1st electrode 11, a surface electrode 3a of the piezoelectric plate 3 connects to the 2nd electrode 12 by a wire 6, the diaphragm 1 is covered in a contactless state and a cover 20 with sounding holes 21 is adhered and fixed to the base 10.

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CLIPPEDIMAGE= JP02000004499A
PAT-NO: JP02000004499A
DOCUMENT-IDENTIFIER: JP 2000004499 A
TITLE: PIEZOELECTRIC DIAPHRAGM AND PIEZOELECTRIC
ACOUSTIC COMPONENT USING THE
PIEZOELECTRIC DIAPHRAGM

PUBN-DATE: January 7, 2000

INVENTOR-INFORMATION:

NAME	COUNTRY
YAMAMOTO, TAKASHI	N/A
TAKESHIMA, TETSUO	
KISHIMOTO, KENJI	N/A

N/A

ASSIGNEE-INFORMATION:

NAME	COUNTRY
MURATA MFG CO LTD	N/A

APPL-NO: JP10167900
APPL-DATE: June 16, 1998

INT-CL_(IPC): H04R017/00; H03H009/10

ABSTRACT:

PROBLEM TO BE SOLVED: To obtain a piezoelectric acoustic component that is easily configured to be a surface mount type with excellent acoustic conversion efficiency and used for a sound source of plural sounds.

SOLUTION: Three slits 2c1-2c3 are formed in parallel with a top plate being a

metallic plate 2 that is drawn as a cap and plural rectangular piezoelectric plates 3, 4 are adhered face to face to parts among the slits to configure plural unimorph diaphragms 1. The slits 2c1-2c3 of the diaphragm 1 are sealed by a flexible sealing material, a lower end of a circumferential wall of the metallic plate 2 is adhered to a base 10 to form an acoustic space between the metallic plate 2 and the base 10. Surface electrodes of piezoelectric plates 3, 4 connect with input electrodes 11, 12 by wires 7, 8 and the metallic plate 2 connects with an earth electrode 13. The diaphragm 1 is covered in a contactless state and a cover 20 with sounding holes 21 is fixed on the base 10.

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CLIPPEDIMAGE= JP02001036990A

PAT-NO: JP02001036990A

DOCUMENT-IDENTIFIER: JP 2001036990 A

TITLE: PIEZOELECTRIC ELECTRO-ACOUSTIC TRANSDUCER

PUBN-DATE: February 9, 2001

INVENTOR-INFORMATION:

NAME

TAKESHIMA, TETSUO

COUNTRY

N/A

ASSIGNEE-INFORMATION:

NAME

MURATA MFG CO LTD

COUNTRY

N/A

APPL-NO: JP11207199

APPL-DATE: July 22, 1999

INT-CL_(IPC): H04R017/00

ABSTRACT:

PROBLEM TO BE SOLVED: To obtain a uni-morph type piezoelectric electro-acoustic transducer for easily connecting electrodes arranged between ceramics layers, and for reducing manufacturing costs.

SOLUTION: In this electro-acoustic transducer, plural rectangular piezoelectric ceramics layers 2a and 2b are laminated so that a laminated body can be formed, and main face electrodes 4 and 5 are formed on the surface and back main faces of the laminated body, and an inner electrode 6 is formed between each ceramics

layer 2a and 2b, and the ceramics layers 2a and 2b are polarized backward in the thickness direction, and a rectangular metallic plate 3 is attached to the back face of the laminated body. In this case, conductive grooves 7a and 7b whose bottom faces deeply reach the inner electrode 6 and the metallic plate 3 are formed on the surface near the opposite two sides of the laminated body in parallel with the sides, and conductive materials 8a and 8b are embedded in the conductive grooves so that the main face electrodes 4 and 5 are conducted, and the inner electrode 6 is led to the surface side.

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CLIPPEDIMAGE= JP02001095094A

PAT-NO: JP02001095094A

DOCUMENT-IDENTIFIER: JP 2001095094 A

TITLE: PIEZOELECTRIC ELECTROACOUSTIC TRANSDUCER

PUBN-DATE: April 6, 2001

INVENTOR-INFORMATION:

NAME

COUNTRY

TAKESHIMA, TETSUO

N/A

KISHIMOTO, KENJI

YAMAMOTO, TAKASHI

N/A

HAMADA, KAZURO

N/A

N/A

ASSIGNEE-INFORMATION:

NAME

COUNTRY

MURATA MFG CO LTD

N/A

APPL-NO: JP2000207729

APPL-DATE: July 10, 2000

INT-CL_(IPC): H04R017/00; H01L041/09

ABSTRACT:

PROBLEM TO BE SOLVED: To obtain a piezoelectric electroacoustic transducer, capable of constituting a bimorph-type diaphragm by simple connecting structure by eliminating the mutual connection of a main surface electrode and internal electrode.

SOLUTION: Two or three piezoelectric ceramics layers 31 and 32 are laminated to form a laminated product, main surface electrodes 33 and 34 are formed on the front/rear surface of this laminated product, and an internal electrode 35 is formed between each of the layers 31 and 32. All the ceramics layers 31 and 32 are polarized in the same direction in the direction of thickness, and an alternating signal is impressed between the electrodes 33, 34 and the electrode 35 to allow the laminated product to generate bending oscillation as a whole.

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9 (10)

CLIPPEDIMAGE= JP02000310990A
PAT-NO: JP02000310990A
DOCUMENT-IDENTIFIER: JP 2000310990 A
TITLE: PIEZOELECTRIC SOUND COMPONENT

PUBN-DATE: November 7, 2000

INVENTOR-INFORMATION:

NAME	COUNTRY
TAKESHIMA, TETSUO	N/A
KISHIMOTO, KENJI	
OSHIRO, MUNAYUKI	N/A
NOMURA, AKIHIRO	
FUJINO, MASAYUKI	N/A

N/A

N/A

ASSIGNEE-INFORMATION:

NAME	COUNTRY
MURATA MFG CO LTD	N/A

APPL-NO: JP11293203

APPL-DATE: October 15, 1999

INT-CL_(IPC): G10K009/122; H03H009/10 ; H04R017/00

ABSTRACT:

PROBLEM TO BE SOLVED: To obtain a piezoelectric sound component which has high production efficiency and excellent sound transduction efficiency and is small-sized.

SOLUTION: A unimorph type diaphragm 1 is constituted by sticking a rectangular metal plate 3 on one surface of a rectangular piezoelectric plate 2, both the lengthwise end parts of the diaphragm 1 are fixed to support parts 4d formed inside two opposite side wall parts 4b of a case 4 by using an adhesive 5 or elastic sealing material 6, and the gap between the two remaining sides of the diaphragm 1 and case is sealed with the elastic sealing material 6. The metal plate 3 is connected to a 1st conduction part 7 of the case 4 with conductive paste 9 and the other surface electrode of the piezoelectric plate 2 is connected to a 2nd conduction part 8 of the case 4 with conductive paste 9. Lastly, the opening part of the case 4 is closed with a lid plate 10 having a sound radiation hole 11.

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CLIPPEDIMAGE= JP02000312398A
PAT-NO: JP02000312398A
DOCUMENT IDENTIFIER: JP 2000312398 A
TITLE: ELECTROACOUSTIC TRANSDUCER

PUBN-DATE: November 7, 2000

INVENTOR-INFORMATION:

NAME

KISHIMOTO, KENJI
TAKESHIMA, TETSUO

COUNTRY

N/A

N/A

ASSIGNEE-INFORMATION:

NAME

MURATA MFG CO LTD

COUNTRY

N/A

APPL-NO: JP11293205

APPL-DATE: October 15, 1999

INT-CL_(IPC): H04R017/00; G10K009/122

ABSTRACT:

PROBLEM TO BE SOLVED: To obtain an electroacoustic transducer that has a high sound pressure.

SOLUTION: A diaphragm 1 is configured by adhering one-side electrode of a rectangular piezoelectric plate of which both sides have an electrode to one side of a rectangular metallic plate, two short sides of the diaphragm 1 are fixed to a support part of a support 10 with an adhesive 4 and a gap

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CLIPPEDIMAGE= JP02001168405A

PAT-NO: JP02001168405A

DOCUMENT-IDENTIFIER: JP 2001168405 A

TITLE: LAMINATED PIEZOELECTRIC ELEMENT AND
MANUFACTURING METHOD THEREFOR

PUBN-DATE: June 22, 2001

INVENTOR-INFORMATION:

NAME

IMAZU, SHINJI

COUNTRY

N/A

ASSIGNEE-INFORMATION:

NAME

SUMITOMO METAL ELECTRONICS DEVICES INC

COUNTRY

N/A

APPL-NO: JP11345809

APPL-DATE: December 6, 1999

INT-CL_(IPC): H01L041/083; B81B003/00 ; H01L041/22

ABSTRACT:

PROBLEM TO BE SOLVED: To provide a laminated piezoelectric element which enhances rigidity and dimensional accuracy of a drive plane, using simple structure.

SOLUTION: A groove part 20, reaching from an upper plane to a lower plane, is formed in a part relevant to a ridge part in a lamination direction of laminate 10, and as a conductor part 21 for electrically connecting an internal electrode 12 to an external electrode 13 every layer of the internal electrode

is provided in the internal wall of the groove part 20, a stress concentration at the time of operating is mitigated to restrict a generation of cracks, etc., thereby preventing a breakdown. Furthermore, a connection failure of the conductor part 21 is prevented, and since it is unnecessary to provide the external electrode on a drive plane 14, irrespective of a method for forming the external electrode, it is possible to enhance rigidity and dimensional accuracy of the drive plane 14 using a simple structure. Furthermore, as it is unnecessary to form a groove on a side plane of the laminate 10, bending strength is enhanced to prevent breakdown at operating, and since a pair of external electrodes 13 are not close to each other, it is possible to prevent electrical short-circuiting, and to increase an active part area, to increase a displacement to enhance an extension ratio.

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